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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/585,855

07/12/2006

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EXAMINER

PAK, SUNG H

ART UNIT

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2874

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/585,855	Applicant(s) MIYACHI ET AL.	
	Examiner SUNG H. PAK	Art Unit 2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☒ Claim(s) 22-24 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>2/13/08, 7/12/06</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Information Disclosure Statement

Information disclosure statement filed 7/21/2006 and 2/13/2008 have been entered.

The information disclosure statement filed 2/13/2008 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent listed that is not in the English language. It has been placed in the application file, but the information referred to therein has not been considered.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Ohta et al. (US 6,266,116 B1- hereinafter “Ohta”).

Ohta discloses a liquid crystal display device comprising a pair of substrates substantially parallel to each other (e.g. Fig. 31), at least one of the substrates being transparent (column 9 lines 43-48); and a liquid crystal layer sandwiched and held between the substrates ('LC' Fig. 31), wherein a plurality of pixels each constituted by parts of the respective substrates and a part of

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the liquid crystal layer sandwiched between the parts of the substrates are arranged in a matrix pattern (Fig. 3), each of the pixels includes first and second electrodes for generating, between the substrates, an electric field in a direction substantially parallel to the substrates and is divided into a plurality of regions (e.g. 'CT', 'PX' Fig. 1), the regions of each of the pixels are defined by the first and second electrodes (Fig. 1), the direction of an electric field generated in one of the regions is opposite to that of an electric field generated in an adjacent one of the regions (column 18 lines 24-32), and the liquid crystal layer has a structure in which when no electric field is generated, a slow axis indicating a refractive-index anisotropy as viewed in a direction normal to the substrates in each of the regions is vertical or parallel to the direction in which an electric field is to be generated (Fig. 2C) whereas when an electric field is generated, the slow axis rotates about an axis normal to the substrates and slow axes in adjacent ones of the regions rotate in opposite directions (Fig. 2D, Fig. 12B; column 17 line 45- column 18 line 62);

wherein polarization is present in the liquid crystal layer when no electric field is generated between the first and second electrodes (column 18 line 63- column 19 line 2);

wherein a component of an average polarization direction in a direction parallel to the substrates is orthogonal to the direction in which an electric field is to be generated, when no electric field is generated between the first and second electrode (Fig. 2A, 2C);

wherein the polarization in the liquid crystal layer is caused by a flexoelectric effect (Figs. 2A-2B; column 18 line 64- column 19 line 8);

wherein the liquid crystal layer contains liquid crystal molecules having a pretilt angle with respect to at least the interface between the liquid crystal layer and one of the substrates (column 17 lines 45- column 18 line 22);

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wherein a direction obtained by projecting a pretilt direction of the liquid crystal molecules is orthogonal to the direction of an electric field generated between the first and second electrodes (column 17 lines 45- column 18 line 22);

wherein the pretilt angle of the liquid crystal molecules is defined by one of a rubbing process and a photo-alignment process (column 17 lines 45- column 18 line 22);

wherein the liquid crystal molecules have pretilt angles with respect to both of the interface between the liquid crystal layer and one of the substrates and the interface between the liquid crystal layer and the other substrate, and directions obtained by projecting pretilt directions of the liquid crystal molecules onto the respective substrates are identical (column 17 lines 45- column 18 line 22);

wherein the first and second electrodes are driven such that potential levels of the respective first and second electrodes alternate with each other (e.g. Fig. 5A-5B);

wherein each of the pixels includes a switching element for driving the liquid crystal layer, signal lines and scanning lines, the signal lines and the scanning lines are connected to the switching element and arranged in a lattice pattern, and the first and second electrodes extend in parallel with the signal lines or the scanning lines (Fig. 11);

wherein the first and second electrodes are alternately arranged (Fig. 11);

wherein at least part of the periphery of an electrode group composed of the first and second electrodes is constituted by opposed electrodes connected to a common line (Fig. 14);

wherein the liquid crystal layer is in the state of a splay orientation (column 18 lines 1-5).

Regarding claims 13-15, it is respectfully noted that pending claims contain “functional language” limitations, wherein an “apparatus” claim is further limited by functions performed by the claimed apparatus (i.e. “... the liquid crystal layer is driven... by a positive electric field...” as recited in claim 13; “... a pulse voltage applied to the liquid crystal layer is set at zero temporarily...” as recited in claim 14; “... a pulse voltage applied to the liquid crystal layer in vertical synchronization period...” as recited in claim 15, etc).

As stated in MPEP §2114, “[w]hile features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function.” *In re Schreiber*, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997). A claim containing “a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus” if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). As such, while the functional language limitations are not ignored, such limitations are not given patentable weight, and the claimed limitations are anticipated if a prior art apparatus is capable of performing the claimed function. MPEP §2114. In the present case, the prior art cited discloses all the structural elements of the claimed invention, and would be capable of performing the claimed function. Therefore, the claim rejection over the cited prior art reference above is proper.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohta et al. (US 6,266,116 B1).

Ohta discloses a liquid crystal display device as discussed above. However, it does not explicitly teach the liquid crystal layer in the state of hybrid or bend orientations as claimed. On the other hand, the use of liquid crystal layers in the state of hybrid or bend orientation is well known and common in the liquid crystal display art. Hybrid and bend orientations are readily recognized as advantageous and desirable to one of ordinary skill in the art because such orientations provide highly effective light transmission and modulation configurations. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the

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invention was made to modify the device of Ohta to have liquid crystal layer in the state of hybrid or bend orientations.

Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohta et al. (US 6,266,116 B1) in view of Kagawa et al. (US 6,423,385 B1- hereinafter “Kagawa”).

Ohta discloses a liquid crystal display device as discussed above. However, it does not explicitly teach the dielectric-constant anisotropy of the liquid crystal layer being less than one, as claimed.

On the other hand, Kagawa discloses the use of a liquid crystal layer with dielectric-constant anisotropy less than one (column 3 lines 34-54). Kagawa teaches that such configuration is advantageous and desirable because it allows for liquid crystal display device with high response speed and low driving voltage (column 3 lines 24-33). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the device of Ohta to have liquid crystal layer with dielectric-constant anisotropy of less than one, in the manner taught by Kagawa.

Allowable Subject Matter

Claims 22-24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: as discussed above, a liquid crystal display device having the slow axis rotating about an axis

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normal to the device substrates and slow axes of adjacent regions rotate in opposite directions, is known in the art at discussed above. However, none of the prior art fairly teaches or suggests *a method of driving such liquid crystal display device* comprising driving the liquid crystal layer at an even multiple of a frame frequency a video signal, and wherein a period which the liquid crystal layer is driven by a positive electric field is equal to a period in which it is driven by a negative electric field; or wherein a pulse voltage is set a zero temporarily at every vertical synchronization period; or wherein a pulse voltage applied to the liquid crystal layer in vertical synchronization period has a polarity opposite to that of the signal voltage applied to the crystal layer in the same vertical synchronization period, in the manner claimed in the instant application.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SUNG H. PAK whose telephone number is (571)272-2353. The examiner can normally be reached on Monday- Friday, 9AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on (571)272-2344. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Sung H. Pak
Primary Examiner
Art Unit 2874

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